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ABSTRACT

Six sociometric measures were evaluated on a sample of 85 four-year-olds from three preschool and day care centers. Stability, intercorrelations, and accuracy of classifying rejected children were compared for measures of social preference, social impact, peer ratings, alternative status, and positive and negative nominations. Test-retest correlations were moderately high and quite similar for all measures except that of social impact. Children were classified as rejected or not rejected based on Z-scores of -1.0 on all measures but one; negative nominations employed a Z-score of +1.0. In comparison to the commonly used social preference measure, accurate classifications were obtained using negative nominations, peer ratings, and alternative status. Positive nominations were somewhat less accurate in identifying rejected children and social impact was a poor index of social status. Results suggest that nominations and peer ratings can both be assessed reliably among preschool children and the two sociometric techniques measure similar aspects of social status. The alternative status measure, first developed by Asher and Dodge (1986), was demonstrated to be a reliable and accurate measure for identifying rejected children in the preschool years. Implications of the research for social skills intervention are discussed. (Author/RH)

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The Sociometric Classification of Preschool Children: Measures of Stability and Construct Validity

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Abstract

Six sociometric measures were evaluated on a sample of 85 four-year-olds from three preschool and day care centers. Stability, intercorrelations, and accuracy of classifying rejected children were compared for measures of social preference, social impact, peer ratings, alternative status, and positive and negative nominations. Test-retest correlations were moderately high and quite similar for all measures except social impact. Children were classified as rejected or not rejected based on Z scores of -1.0 on all measures except negative nominations which employed a Z of +1.0. In comparison to the commonly used social preference measure, accurate classifications were obtained using negative nominations, peer ratings, and alternative status. Positive nominations were somewhat less accurate in identifying rejected children and social impact was a poor index of social status. The results suggest that nominations and peer ratings can both be assessed reliably with preschool children and the two sociometric techniques are measuring similar aspects of social status. The alternative status measure, first developed by Asher and Dodge (1986), was demonstrated to be a reliable and accurate technique for identifying rejected children in the preschool years. Implications of the research for social skills intervention are discussed.

The Sociometric Classification of Preschool Children: Measures of Stability and Construct Validity

The use of sociometric status measures to assess social competence in preschool children has become increasingly widespread in recent research. Early studies relied on peer nomination measures (Hartup, Glazer, & Charlesworth, 1967; Marshall & McCandless, 1957). Hymel (1983) reviewed the use of sociometrics with preschoolers and concluded that nomination measures are correlated with concurrent measures of social competence, including behavioral observations, social-cognition, and teacher ratings. However, nominations have been found to have only moderate test-retest reliability with preschoolers, and negative nominations are usually less reliable than positive nominations (Hartup, 1983; Hymel, 1983).

Asher, Singleton, Tinsley, and Hymel (1979) have developed a peer rating technique for use with preschoolers that has been found to be significantly more reliable than nominations. Test-retest correlations at 4-week intervals were .81 and .74 for ratings versus .56 and .38 for positive nominations and .42 for negative nominations.

Despite the superior reliability of the rating scale, nomination measures of sociometric status continue to be used with preschool children. One reason for this is the concurrent validity of the nomination (Hymel, 1983). Another reason is that researchers often want to distinguish between different categories of social status. Coie,

Dodge, and Coppotelli (1982) and Peery (1979) have suggested assessing a new dimension of social status, social impact, defined as the sum of positive and negative nominations. Social impact has been combined with social preference (positive nominations minus negative nominations) to identify a variety of categories of social status (e.g., popular, rejected, neglected, average, and controversial). The stability and concurrent validity of social impact and social preference with preschool children have not been systematically assessed, although research by Newcomb and Bukowski (1983) with older children has cast some doubt on the utility of the social impact dimension.

Of particular interest is the distinction between rejected children (those who receive many negative and few positive nominations) and neglected children (those who receive few positive or negative nominations) which requires the use of nominations. Much evidence suggests that rejected and neglected children differ in behavior, feelings of loneliness and that, while the risk of later adjustment problems is high for rejected children, the risks associated with neglected status are unclear (Asher & Dodge, 1986).

However, the use of negative nominations for identifying rejected children has raised ethical concerns. Although Hayvren and Hymel (1984) found no adverse effects of a negative nomination sociometric on the interactions of preschoolers, many researchers and school officials are reluctant to ask children to nominate peers that they dislike. Asher

and Dodge (1986) have developed an alternative procedure for identifying rejected children using only ratings and positive nominations by substituting the frequency of the lowest rating for negative nominations. This technique was used to accurately identify rejected elementary school children but has not been tested with preschool children.

Few studies have systematically compared ratings and nominations with preschool children. Gresham (1981) conducted a factor analysis of ratings, nominations, and behavioral observations with 3rd and 4th grade low-status children. He found that the three measures loaded on separate factors, with nominations accounting for 29% of the variance, observations for 26%, and ratings for 21%. He concluded that nominations and ratings measure different components of social competence, although both measures showed similar relationships to behavior. The correlation between the two nomination measures (play with and work with) was high (r = .82, p<.0001) as was the correlation between the two rating measures (r = .88, p<.0001). The correlations between nominations and ratings were much lower (r = .44, p<.004), in each case). In contrast to the findings of Asher et al. (1979) with preschoolers, Gresham found similar test-retest correlations for nominations and ratings. Stability coefficients for play-with nominations ranged from .32 to .62 over six-week intervals, while play-with ratings coefficients ranged from .30 to .59.

Goldman, Corsini, and DeUrioste (1980) examined the relationships between ratings, nominations, and behavioral measures in preschoolers. They found a positive correlation between rating scores and social status (defined as the number of positive nominations minus the number of negative nominations) in four-year-old children (r = .59, p<.001). It should be noted that Goldman et al. defined rating scores as the number of times a child was rated as most liked minus the number of times he/she was rated as most disliked, rather than the more common mean or median rating score. Given this definition, the similarity between the two measures is not surprising. Goldman et al. did not report test-retest correlations.

The purpose of the present study was to measure the reliability and utility of social status classification based on peer nominations and peer ratings. A second purpose was to assess the classification system proposed by Asher and Dodge (1986) for identifying rejected preschool children.

Method

Subjects and Setting

A total of 85 preschool children (44 girls & 41 boys) in five classrooms from three different day care centers served as subjects. Day care center 1 was a university sponsored program which operated on a half-day basis (n = 27). Center 2 was a private-for-profit, full-time program (n = 21). Center 3 was a community sponsored non-profit program

serving both private and public-funded children (n = 37). The children in center 1 were predominantly white and from middle-class or professional families. All the children in center 2 were white from a variety of working and middle-class homes. Most of the children in center 3 were black (83%) and were primarily drawn from lower SES families. Many of the children in Center 3 received public funding and were from families in which the parents were either not employed or were enrolled in job training programs. Of the total sample, 47 of the subjects were white, 33 were black, and 5 were of Asian or Eastern Indian heritage. Overall, the sample consisted of children from a number of diverse ethnic and cultural backgrounds. The median age at pretest was 54-months and 25% of the subjects were at or below 48-months old. Informed parental consent was obtained for all subjects before their inclusion in the study.

Sociometric Procedures

Sociometric status was assessed using both nominations (positive and negative choices) and peer ratings. All sociometric measures were collected by two female graduate students using individual interviews. Subjects were first asked to identify 5 X 3.5 inch photographs of every child in their classroom. The photographs were made using a Nikon FM Camera with a Nikor 105 mm lens and Kodacolor ASA 100 film. The photographs were made using a flash from approximately 2 meters which resulted in a picture of the child's head and upper torso. Children who

could not identify classmates were told the child's name, but this was an uncommon occurrence.

Subjects were then trained to nominate liked and disliked foods and to rate foods as liked, neutral, or disliked. Peer nominations were collected using the technique developed by McCandless and Marshall (1957). Each subject was shown a picture-board with photographs of all of his or her classmates and asked, "Which one do you really like to play with?" When a photograph was chosen, it was removed from the board and the subject was then asked to choose a second and then a third classmate. Negative nominations were obtained in the same manner except that subjects were asked, "Which one do you really not like to play with?" A three-point Likert-type scale developed by Asher et al. (1979) was used to collect peer ratings. Subjects were shown photographs of each classmate (presented in a random order) and asked, "How much do you like to play with child's name?" Subjects were required to point to one of three pictures of a happy face ("I like to a lot."), a neutral face ("Sometimes I do and sometimes I don't."), or a sad face ("I don't like to at all."). At the end of each interview the subject was read a story designed to serve as a distractor task and to minimize the likelihood that the child would discuss the interview after returning to class. Retest data were collect approximately 7 weeks later (range of 5 to 9 weeks).

Results

The test-retest stability and consistency of classification were analyzed using Pearson Product Moment Correlation Coefficients and contingency tables. Stability (reliability) data were computed for both raw and standardized (Z) classroom scores. Classification tables were constructed on the basis of standardized scores. (It should be noted that standardized Z scores are based on a linear transformation which does not effect either the rank order or interval between scores within each classroom. The transformation does equate scores from classrooms with different means and standard deviations.) The analyses were based on the following variables: (a) social preference (positive nominations - negative nominations), (b) social impact (positive nominations + negative nominations), (c) mean peer-rating, (d) alternative status (positive nominations - frequency of lowest ratings), (e) positive nominations, and (f) negative nominations. Nomination scores were adjusted for the possible number of nominations in each classroom.

Test-retest stability coefficients were significant ($p = .0001$) for all sociometric measures. The stability coefficients based on raw data were higher for all measures than the corresponding coefficients based on standardized scores. Inspection of Table 1 indicates that social preference was the most stable measure of sociometric status [r_s (82) = .73 and .72 for raw and standard scores, respectively]. Very similar stability coefficients were obtained for peer-ratings and alternative

status. Stability coefficients were slightly lower for positive and negative nominations, while social impact appeared to be a relatively less stable measure of social status.

Insert Table 1 about here

Intercorrelations between the six measures of sociometric status are presented in Tables 2 (pretest) and 3 (posttest). On the pretest, social preference was significantly correlated with peer-ratings, alternative status, and positive nominations. Social preference was inversely correlated with negative nominations. Social impact was significantly correlated with positive and negative nominations, but showed no relationship with other measures. Peer ratings were positively related to alternative status and positive nominations, and negatively correlated with negative nominations. Alternative status was also positively correlated with positive nominations and inversely correlated with negative nominations. Positive and negative nominations were inversely related. A similar pattern of intercorrelations was found for the posttest scores, with the exception that social impact standardized scores showed a small, significant negative correlation with both peer ratings ($p = .04$) and alternative status ($p = .01$).

Insert Tables 2 & 3 about here

Contingency tables were calculated to determine the utility of different measures of sociometric status in the classification of rejected children compared to social preference. Subjects were classified as rejected using a Z-score of -1.0 for all measures except for negative nominations for which the criterion was a Z of +1.0. The resulting classification tables are presented in Tables 4 (pretest) and 5 (posttest).

Classification based solely only negative nominations corresponded closely to those based on social preference. For example, on the pretest, 93% of the subjects were appropriately classified. Only four students (5%) were incorrectly classified as not rejected (false negatives) and two were incorrectly classified as rejected (false positives). Peer ratings and alternative status also corresponded highly with the classifications based on social preference. Positive nominations were somewhat less accurate in classifying children as rejected or not rejected, and classifications based on social impact showed little correspondence to those based on social preference. The accuracy of classification is also demonstrated by Chi-Squares using probabilities based on Fisher's exact test which were significant for all measures except social impact.

Insert Tables 4 & 5 about here

Discussion

The results of the present investigation suggest that nomination measures of SMS can be reliably used with preschool children, in contrast to earlier findings of Asher et al. (1979) and conclusions drawn by Hymel (1983) and Hartup (1983). Consistent with findings of Gresham (1981) with elementary school children, nomination and rating measures showed similar stability (r_s = .64 - .68 for nomination measures and .55 - .66 for ratings). Positive and negative nominations were equally reliable, also in contrast to earlier studies reviewed by Hymel (1983). Hymel's conclusion that peer nominations, especially negative nominations, cannot be reliably measured in preschoolers was perhaps based on a limited number of studies and further research is indicated before rejecting these measures as unreliable.

In addition, peer ratings and peer nominations showed a moderate and significant correlation in the present study. Peer ratings showed a positive correlation to positive nominations, (r_s = .56 and .60) and an inverse correlation with negative nominations (r_s = -.54 and -.61). This finding contrasts with Gresham's (1981) factor analysis which suggested that ratings and nominations measure different aspects of sociometric status.

Many researchers use classification systems based on nominations or ratings to identify categories of social status such as popular, rejected, and neglected. We have focused on identifying rejected children because of their demonstrated risk for later adjustment problems. Overall, alternative status, peer ratings, positive and negative nominations were moderately to highly correlated with social preference. Social impact had the weakest relationship to the other measures of sociometric status, and was also the least reliable measure. These data support Newcomb and Bukowski's (1983) observation that neglected status (based on low social impact scores) was the least stable of five sociometric classifications, and cast some doubt on the use of the social impact dimension in classification systems (Coie, Dodge, & Coppotelli, 1982; Peery, 1979). However, social impact may reflect another dimension of social status not examined in the present study.

Our measure of alternative status is similar to that devised by Asher and Dodge (1986) for identifying rejected children without using negative nominations. Asher and Dodge demonstrated the reliability and accuracy of this measure with elementary school children, but it has not yet been used with preschoolers. Based on our findings, alternative status seems to be a reliable (r = .73) measure of preschool SMS which correlates moderately well with positive and negative nominations (rs = .56 and .60 and -.54 and -.61 at pretest and posttest). Alternative

status is also highly correlated with peer ratings (mean r = .92). In comparison to social preference, approximately 83% of rejected children and 95% of nonrejected children were identified correctly using alternative status. Thus it seems possible to identify rejected preschool children reliably and accurately without the use of negative nominations. This is particularly useful since young children sometimes have difficulty understanding instructions to select children with whom they do not like to play. Alternative status and peer ratings also have the advantage of avoiding the ethical concerns raised by the use of negative nominations.

The research literature offers a plethora of techniques and classification schemes for identifying the social status of children. Peer rejection based on negative nominations or measures of social preference continues to have the best evidence of predictive validity. The present study demonstrates that both alternative status and peer ratings can be used to identify rejected children without obtaining negative nominations.

The identification of socially rejected preschool children has important implications because of the demonstrated risks associated with social rejection in childhood (Cowen, Pederson, Babigian, Izzo, & Trost, 1973; Roff, Sells, & Golden, 1972). The status of rejected children becomes very stable during the elementary years (Blyth, 1983), an observation which suggests that once a child has developed a social

reputation, his or her social status becomes increasingly difficult to modify as they get older.

The relatively less stable social status measures found among preschool children suggest that social status is more fluid and perhaps more amenable to change during this period. This finding, coupled with the successful attempts to modify social behavior and social status (Asher, 1985), indicates that the preschool years are an optimal time for intervention strategies.

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Table 1

Stability coefficients for six measures of sociometric status

Variable	Raw Scores	Standardized Scores
Social Preference	.73	.72
Social Impact	.55	.43
Alternative Status	.73	.67
Peer Rating	.72	.67
Positive Nominations	.67	.64
Negative Nominations	.68	.66

Note. All stability correlation coefficients are significant at a .0001 level.

Table 2

Intercorrelations of six measures of sociometric status for pretest data

	Raw Scores				
	2	3	4	5	6
1. Social Preference	-.09*	.68	.52	.79	-.83
2. Social Impact	—	.02*	.08*	.53	.63
3. Peer Rating	—	—	.89	.56	-.54
4. Alternative Status	—	—	—	.49	-.36
5. Positive Nominations	—	—	—	—	-.32
6. Negative Nominations	—	—	—	—	—
	Standardized Scores				
1. Social Preference	-.12*	.72	.74	.80	-.86
2. Social Impact	—	-.17*	-.17*	.48	.60
3. Peer Rating	—	—	.95	.54	-.66
4. Alternative Status	—	—	—	.55	-.67
5. Positive Nominations	—	—	—	—	-.39
6. Negative Nominations	—	—	—	—	—

Note. All correlations are significant at $p < .001$ except as indicated.

*$p > .10$.

Table 3

Intercorrelations of six measures of sociometric status for posttest data

	2	3	4	5	6
Raw Scores					
1. Social Preference	-.19*	.72	.58	.81	-.87
2. Social Impact	—	-.11*	.05*	.42	.65
3. Peer Rating	—	—	.88	.60	-.61
4. Alternative Status	—	—	—	.57	-.42
5. Positive Nominations	—	—	—	—	-.41
6. Negative Nominations	—	—	—	—	—
Standardized Scores					
1. Social Preference	-.24**	.72	.72	.84	-.89
2. Social Impact	—	-.23**	-.27**	.31**	.64
3. Peer Rating	—	—	.96	.57	-.67
4. Alternative Status	—	—	—	.55	-.69
5. Positive Nominations	—	—	—	—	-.51
6. Negative Nominations	—	—	—	—	—

Note. All correlations are significant at $p < .001$ except as indicated.

*$p > .05$.

Table 4

Classification of rejected children using six different measures of social status at pretest

	Method					
Status	Social Preference	Social Impact	Peer Ratings	Alternative Status	Positive Nominations	Negative Nominations
Not Rejected	n = 70	n = 71	n = 72	n = 71	n = 71	n = 72
False Negatives		15 (21%)	4 (6%)	3 (4%)	8 (11%)	4 (6%)
Rejected	n = 15	n = 14	n = 13	n = 14	n = 14	n = 13
False Positives		14 (100%)	2 (15%)	2 (14%)	7 (50%)	2 (15%)
Chi-Square		3.59	43.72	53.43	12.07	47.36
Fisher's exact test p		.0656	.0000	.0000	.0023	.0000

Table 5

Classification of rejected children using six different measures of social status at posttest

	Method					
Status	Social Preference	Social Impact	Peer Ratings	Alternative Status	Positive Nominations	Negative Nominations
Not Rejected	n = 70	n = 65	n = 70	n = 71	n = 67	n = 72
False Negatives		13 (20%)	4 (6%)	4 (6%)	6 (9%)	3 (4%)
Rejected	n = 15	n = 20	n = 15	n = 14	n = 18	n = 13
False Positives		18 (90%)	4 (27%)	3 (21%)	10 (50%)	1 (8%)
Chi-Square		1.052	38.86	42.81	16.45	58.87
Fisher's exact test p		.5036	.0000	.0000	.0003	.0000